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Incubating Innovation: The Impact of University Startup Incubators on Student Ventures in Iringa Municipal.

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Abstract: *This study examined the impact of university startup incubators on student ventures in Iringa Municipal, Tanzania. The purpose was to assess how incubator programs influenced the growth, sustainability, and innovation capacity of student-led businesses in a semi-urban context. A descriptive cross-sectional research design was employed, involving 112 student entrepreneurs drawn from local universities using purposive and stratified sampling techniques. Data were collected through structured questionnaires, key informant interviews, and document reviews. Quantitative data were analyzed using SPSS, while qualitative responses were subjected to thematic analysis. The findings revealed that university incubators played a significant role in providing essential resources such as office space (80.4%), internet access (75.9%), and business development training (67.9%). However, only 42.9% accessed seed funding, and personalized mentorship was limited to 38.4%. Despite these constraints, 69.6% of student ventures remained operational, with over half generating revenue. Key challenges included lack of capital (75%), limited market access (55.4%), and bureaucratic hurdles in business registration (44.6%). The study was limited to two institutions in Iringa, which may not fully represent the national landscape. However, it provides practical implications for universities and policymakers to strengthen incubation support through improved funding access, targeted mentorship, and streamlined registration processes. Socially, the study highlights the potential of university incubators to reduce youth unemployment and drive local innovation. The originality of this research lies in its focus on a semi-urban Tanzanian setting, offering context-specific insights into student entrepreneurship that are underrepresented in existing literature.*

Keywords: Incubation, Innovation, Startups, Student venture, Access, resources, Entrepreneurship, Prototype, Capital.

1. INTRODUCTION

University startup incubators in Iringa Municipal played a significant role in supporting student entrepreneurs and promoting innovation. These incubators offered critical resources such as mentorship, training, office space, and access to funding opportunities, which helped students transform their ideas into viable businesses. As universities in Iringa embraced entrepreneurship as a tool for economic development, incubators became essential in bridging academic learning with practical business application. This study focused on assessing the impact of these incubators on student-led ventures within Iringa Municipal. It explored how incubator support influenced business development, sustainability, and innovation, based on data collected from students engaged in entrepreneurial activities.

Entrepreneurship education has emerged as a crucial strategy for addressing youth unemployment and fostering economic development globally [1, 2]. Universities are increasingly adopting entrepreneurial approaches to meet the challenges of technological progress, reduced funding, and changing skill requirements ([3]. Effective entrepreneurship education programs focus on practical skill development, mentorship, and industry-aligned curriculum content [2]. These programs aim to equip students with creativity, resilience, and adaptability needed for innovation and leadership [4]. Key strategies include embedding business management skills, establishing partnerships with local businesses, and creating mentorship programs [1]. However, challenges such as financial constraints and insufficient practical training facilities persist [2]. Despite these obstacles, entrepreneurship education shows promise in bridging the gap between academic training and employment creation, contributing significantly to youth employability and economic development [2, 4].

University startup incubators have emerged as vital structures for fostering student entrepreneurship, offering mentorship, infrastructure, and networking opportunities. These incubators significantly enhance students' entrepreneurial mindset, venture creation intentions, and innovation competencies [5]. Acting as pre incubators or pre accelerators, they provide a safe and creative environment for students to develop their business ideas [6]. Research has identified five key features and 12 strategies adopted by university incubators to cultivate student entrepreneurship, demonstrating their role in fostering intellectual capital and entrepreneurial competences [6]. These incubators not only support the creation of concrete new ideas but also offer challenge-based learning approaches to students [6]. As academic entrepreneurship gains popularity, university business incubators play a crucial role in supporting the growth and development of startups founded by university members [7].

Globally, Entrepreneurial ecosystems (EEs) are crucial for fostering innovation and supporting start-up growth in both developed and developing economies [8]. These ecosystems consist of various components, including access to funding, mentorship, and networks [9]. While EEs face challenges, they also present opportunities for economic development and addressing socio-economic issues like unemployment and inequality [10]. Incubators play a vital role as intermediaries in overcoming weak network problems within EEs by facilitating connections between the knowledge and business subsystems [11]. Key factors contributing to successful EEs include professional support, incubators/accelerators, networking opportunities, and R&D investments [9]. However, lack of funding sources, unfavorable labor market conditions, and restrictive social norms can hinder ecosystem development [9]. To promote economic growth, policymakers and stakeholders should invest in developing and fostering EEs across all regions [10].

University-based incubators have emerged as crucial components of national innovation systems in Asia, fostering entrepreneurship and economic development [12, 13]. These initiatives, often supported by government policies, aim to promote innovation, reduce youth unemployment, and address local challenges through student-driven enterprises [13]. Countries like China, India, Singapore, and Malaysia have implemented business incubators to enhance commercialization, create startups, and generate revenue [12, 14]. The role of universities in innovation ecosystems varies across the region, with some focusing on traditional teaching roles while others transform into entrepreneurial hubs [13]. Despite challenges such as lack of expertise and financial constraints in some countries, university incubators contribute to broader socio-economic development by supporting new industries, particularly in technology and service sectors [12, 14].

African universities are increasingly recognizing their role in fostering entrepreneurship to address youth unemployment and promote sustainable development. These institutions are implementing entrepreneurship programs and incubators to bridge the gap between theoretical education and practical business application [15, 16]. Higher education institutions are establishing dedicated bureaus to oversee various university entrepreneurship programs, integrating design thinking into curricula, and expanding partnership networks to enhance their impact [16]. The development of entrepreneurial spirit and competencies is viewed as a lifelong process, requiring lessons from both within and outside Africa [17]. Universities are providing opportunities for nurturing sustainable entrepreneurship and innovation, with creativity identified as a key characteristic for successful sustainable entrepreneurs [18]. These efforts aim to create pathways for students to develop entrepreneurial skills and generate ideas that solve societal problems while creating value.

South African institutions are urged to establish business incubation centers to promote economic growth and create a strong entrepreneurial ecosystem [19]. In Kenya, university-incubated agribusinesses have shown fair sustainability performance, particularly in social aspects, though they face challenges in longevity [20]. To address youth unemployment and prepare future-ready business leaders, emerging economies are encouraged to develop innovation hubs within universities, offering practical activities like competitions and networking events [21]. South African higher education institutions are called upon to actively participate in the country's development through technology and innovation incubators, aligning with the National Development Plan 2030 and the triple helix theory of university-industry-government collaboration [22].

Recent studies highlight the growing importance of entrepreneurship education and business incubation in Tanzania's higher education landscape. Universities are integrating entrepreneurship programs to address youth unemployment and prepare graduates for self-employment [23, 24]. Business incubators in Tanzania generally meet young entrepreneurs' needs by providing mentorship, training, and networking opportunities, though improvements in program duration and funding access are needed [25]. The entrepreneurial environment in Tanzania presents both enablers and hindrances, with factors like family ties and improved banking systems supporting graduate entrepreneurship, while lack of capital and corruption pose challenges [23]. Studies show that graduates who studied entrepreneurship courses have higher entrepreneurial tendencies compared to those who did not [24]. However, business incubators must adapt to local needs and avoid becoming exclusive organizations that reinforce existing societal roles [26].

Studies show that vocational education students in Iringa have a strong interest in starting businesses, driven by a desire for autonomy [27]. To support this, universities are establishing innovation hubs and incubators, which play a crucial role in nurturing student entrepreneurship despite limited resources [28]. These initiatives focus on addressing local needs in key economic sectors. Effective strategies for successful incubators include clear organizational goals, social media marketing, and resource mobilization plans [28]. A comprehensive framework for enhancing entrepreneurship development in Tanzanian universities emphasizes the importance of both formal and informal institutional forces [29]. Additionally, innovation centers in university settings are essential for building entrepreneurial mindsets and preparing future business leaders in emerging economies [21].

Also, the research papers highlight the evolving entrepreneurial landscape in Tanzania, particularly in Iringa region. Business incubators, especially in the agriculture sector, play a crucial role in nurturing start-ups, creating job opportunities, and positively impacting the economy [30].

ICT incubators significantly contribute to the development of new start-ups and the growth of existing ones, although challenges such as capital constraints and unfriendly regulatory frameworks persist [31]. Despite valuing entrepreneurship as a potential career, many graduates struggle to act on their aspirations due to limited access to social capital, which is identified as a critical conversion factor in developing entrepreneurial capability [32].

As Tanzanian universities continue to expand their entrepreneurship support initiatives, understanding the actual impact of startup incubators on student ventures becomes increasingly important. Insights from Iringa Municipal provide a valuable lens through which to examine the effectiveness, limitations, and potential of incubation models in emerging economies. Through a deeper understanding of these dynamics, institutions and policymakers can better design strategies that not only support students in launching businesses but also enhance the broader innovation ecosystem within the country.

While numerous studies have examined the role of university incubators in fostering student entrepreneurship globally and in parts of Africa, there is limited empirical research focused specifically on their impact within smaller municipalities like Iringa in Tanzania. Most existing studies emphasize large urban centers, overlooking the unique socio-economic, institutional, and resource challenges faced in semi-urban or rural settings. This study addresses this gap by exploring how university startup incubators influence student ventures in Iringa Municipal, offering context specific insights that are often absent in broader national or international analyses of student entrepreneurship and incubation.

This study aimed to achieve three key objectives. First, it sought to assess the types of support services provided by university startup incubators in Iringa Municipal and how these services contribute to the development of student ventures. Second, it aimed to evaluate the extent to which student entrepreneurs benefited from incubator programs in terms of business growth, innovation, and sustainability. Third, the study intended to explore the challenges faced by university incubators and student entrepreneurs within the local context. Together, these objectives provided a comprehensive understanding of the incubators' effectiveness in nurturing student-led innovation and entrepreneurship in Iringa Municipal.

This study holds significance for multiple stakeholders, including universities, policymakers, and aspiring student entrepreneurs. By examining the impact of university startup incubators in Iringa Municipal, it provides valuable insights into how such programs can be optimized to support student-led innovation and business development. The findings can help universities strengthen their incubation models and align them with local needs. Additionally, the study offers evidence-based recommendations for policymakers seeking to promote youth entrepreneurship in semi-urban areas. Finally, it contributes to improving economic opportunities and reducing unemployment among university graduates in Tanzania.

The remaining part of this paper is organized as follows, Methodology of the study is in section 2, section 3 contains results and discussion of this study, while conclusion, recommendations and areas for future study are presented in section 4 and lastly acknowledgement to manuscript stakeholders.

2. METHODOLOGY OF THE STUDY

2.1 Research Design

This study employed a descriptive cross-sectional research design to examine the impact of university startup incubators on student ventures in Iringa Municipal. The design was chosen because it allowed for the collection of quantitative and qualitative data at a single point in time, enabling a comprehensive understanding of the relationship between incubator support and student entrepreneurial outcomes.

2.2 Area of the Study

The research was conducted in Iringa Municipal, located in the southern highlands of Tanzania. The area hosts several higher learning institutions, including the University of Iringa and Ruaha Catholic University, both of which have introduced entrepreneurship and innovation programs aimed at supporting student-led ventures. These institutions were selected due to their active engagement in student incubation activities.

2.3 Sample and Sampling Techniques

The study targeted student entrepreneurs who were either currently enrolled in or had recently completed university incubator programs within Iringa Municipal. A total of 112 respondents participated in the study. The sample included students from various academic disciplines involved in startup ventures supported by their university incubators.

A purposive sampling technique was used to select respondents who had direct experience with university startup incubators. This approach ensured that only those with relevant understandings into incubation processes and outcomes were included. Additionally, stratified sampling was applied to ensure a balanced representation across different universities and types of ventures (e.g., ICT, agriculture, manufacturing, services).

2.4 Data Collection Methods and Tools.

Data were collected using both quantitative and qualitative methods to gain a holistic understanding of the incubator's impact: Structured questionnaires were administered to 112 student entrepreneurs. The questionnaire included both closed and open-ended questions focused on the type of support received, the progress of their ventures, challenges encountered, and perceived effectiveness of the incubator. Key informant interviews were conducted with incubator managers, university staff involved in entrepreneurship programs, and selected student entrepreneurs to gather in-depth qualitative insights. An interview guide was used to maintain consistency across interviews. Document review was also carried out, focusing on university reports, incubator program guidelines, and business plans submitted by student ventures.

2.5 Data Analysis

Quantitative data collected from questionnaires were analyzed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize responses and identify trends. Qualitative data from interviews and open-ended questions were analyzed using thematic content analysis. Responses were coded, categorized, and interpreted to identify key themes related to the effectiveness, challenges, and contextual relevance of incubation programs. Triangulation of data from multiple sources ensured the reliability and validity of the findings.

3. RESULTS AND DISCUSSION

In this section the results and discussion of the findings are presented and discussed in the form of access to resources, mentorship support, networking opportunities, business outcomes and challenges faced by student entrepreneurs in the incubation process.

3.1 Access to Resources

Access to resources played a crucial role in shaping the experiences and outcomes of student entrepreneurs involved in university incubators as per results shown in figure 1. The majority of respondents (80.4%) confirmed that they had access to office or workspace through their respective incubators. This space provided a conducive environment for collaboration, planning, and customer interaction. As one respondent noted, *"Having a physical place to work gave our team a real sense of direction and professionalism; we no longer had to meet in hostels or noisy cafés."*

Similarly, 75.9% of the participants reported having access to internet services and IT tools, which were essential for research, communication, and digital marketing. The availability of these resources greatly enhanced the productivity of student ventures, especially those in the ICT and services sectors. According to another respondent,

> *"The free internet and access to computers helped us a lot, especially during product development and when reaching customers through social media."*

Despite these positive aspects, access to seed funding or startup grants remained limited. Only 42.9% of respondents indicated that they had received some form of financial support from the incubator. Most students highlighted this as a major challenge, often citing the lack of capital as a barrier to scaling their businesses. One student shared,

> *"We had a solid idea and even a prototype, but we couldn't take it to market because there was no funding available from the incubator."*

This constraint reflected the broader issue of limited financial capacity within university incubator programs in semi-urban regions. However, in terms of capacity-building, 67.9% of the respondents confirmed the availability of business development training. These sessions covered critical areas such as business planning, marketing, financial management, and customer engagement. Many students credited this training for improving their entrepreneurial skills and confidence. A participant noted,

> *"The business workshops taught me how to manage money and pitch ideas, things I had never learned in class."*

Lastly, 46.4% of respondents reported access to tools or equipment needed for product development. This was especially relevant for students in fields such as engineering (ICT), food processing, or agriculture. While some appreciated the support, others expressed concerns over the limited quantity and outdated condition of available tools. Overall, access to resources provided by incubators had a mixed but generally positive influence on student ventures.

3.2 Mentorship Support

As depicted in figure 2, mentorship support was a significant aspect of the incubation experience for student entrepreneurs, though its availability varied among participants. About 57.1% of respondents reported that they had received regular mentoring sessions through their university incubators. These sessions often involved group discussions and workshops that aimed to guide students on various entrepreneurial challenges. One respondent remarked,

> *"The mentoring sessions helped me understand the steps I needed to take to move from idea to business, especially in managing cash flow and customer relations."*

However, only 51.8% of the students had access to experienced entrepreneurs or professionals outside the academic environment. Many students valued these connections as they provided practical insights and real-world advice that went beyond theoretical learning. Despite these benefits, fewer students, just 38.4%, reported receiving personalized coaching tailored specifically to their startup development needs. Those who did noted that one-on-one coaching sessions significantly improved their strategic planning and problem-solving skills. One participant said,

"The personalized coaching made a big difference because it was focused on my business and helped me refine my model."

Nevertheless, some students expressed dissatisfaction with the mentorship's consistency and depth, indicating that mentorship programs were sometimes too general or infrequent to meet all their needs. Overall, mentorship played an important but uneven role in supporting student ventures within the incubators.

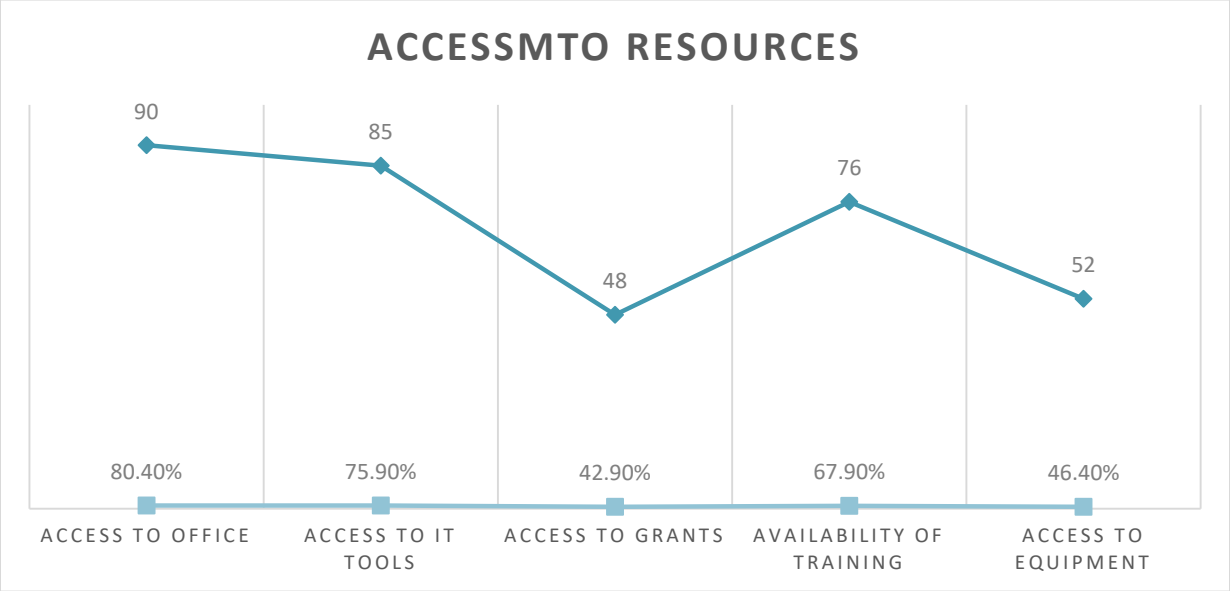

Figure 1: *Access to resources*

3.3 Networking Opportunities

Networking opportunities formed an important part of the support provided by university startup incubators, although the extent of participation and benefits varied among student entrepreneurs. Figure 2 shows that, a majority of respondents, 59.8%, reported that they had participated in startup events or expos organized or facilitated by their incubators. These events provided platforms for students to showcase their products, learn from peers, and gain exposure to potential customers and collaborators. One respondent shared,

"Attending the startup expo was eye opening; it connected me with other entrepreneurs and gave my business visibility that I never had before."

However, fewer students, only 36.6%, benefited from formal linkages to industry partners through their incubator programs. Those who did often mentioned that these partnerships helped them access technical expertise, supply chains, or market channels that were otherwise difficult to reach. A participant explained,

"The connection to a local company helped me source raw materials at a better price, which was crucial for my production process."

Despite these positive experiences, exposure to investors or funding bodies was notably limited, with just 26.8% of respondents reporting contact with such stakeholders. Many students viewed this as a missed opportunity, as direct engagement with investors could have provided critical financial resources and business advice. One student remarked,

"We rarely had the chance to meet investors. Without their support, growing the business was a constant struggle."

Some respondents also expressed concerns that networking activities were often irregular or insufficiently tailored to their specific industries. Generally, while participation in startup events offered valuable networking experiences for many student entrepreneurs, the more strategic linkages to industry and investors were less widespread, limiting the full potential

of incubator programs to facilitate sustainable business growth.

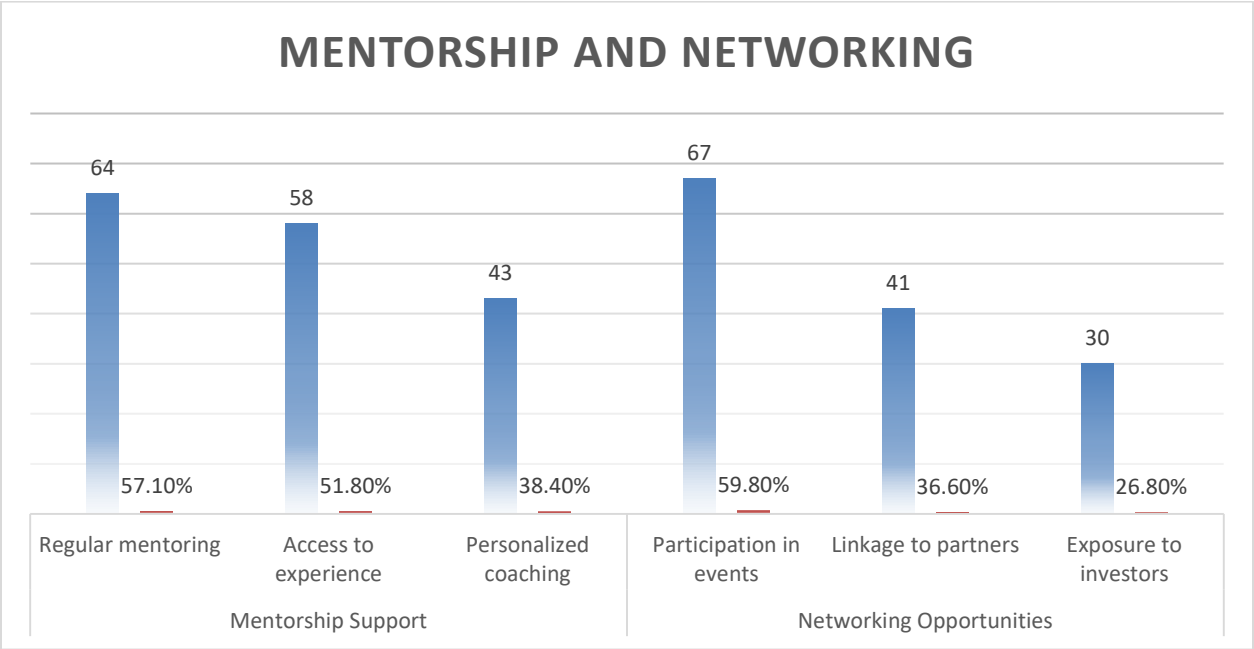

Figure 2: *Mentorship and Networking*

3.4 Business Outcomes

The business outcomes of student ventures supported by university startup incubators reflected a mix of successes and ongoing challenges. A significant majority, 69.6% in figure 3, reported that their startups were still operating at the time of the study, indicating a relatively high survival rate for early-stage businesses. Many students expressed pride in maintaining their ventures despite the difficulties faced. One respondent noted,

> *"Keeping the business running after graduation was tough, but with the skills I gained from the incubator, I managed to stay afloat."*

However, just over half of the participants (54.5%) stated that their startups had generated revenue, suggesting that while many businesses were active, not all were financially sustainable or profitable. Some students admitted that their ventures were still in developmental phases or operating at break-even. A participant shared, "We are making some sales, but it's not enough to cover all expenses yet; we are still growing."

Job creation was less common among these student startups, with only 29.5% having created at least one employment opportunity beyond the founders themselves. This shows the challenges of scaling businesses within the local context. Despite limited job creation, those who succeeded in employing others often credited their incubator's training and networking support. One student explained,

> *"Hiring even one person was a milestone for us; it showed we were starting to contribute to the community."*

Formal registration of startups with government agencies such as BRELA or TRA was reported by 41.1% of respondents. Some students viewed formal registration as a crucial step for legitimacy and access to wider markets, while others found the registration processes cumbersome or costly. A respondent commented,

> *"Registering the business was important because it made customers trust us more, but the paperwork was complicated and slow."*

Overall, the data illustrated that while many student ventures remained operational and had begun generating revenue, significant sprints remained in achieving full formalization and job creation, emphasizing the need for continued support beyond incubation.

3.5 Challenges Faced

The student entrepreneurs faced several significant challenges that hindered the growth and sustainability of their ventures despite the support provided by incubators. The results in figure 4 shows that, a major obstacle reported by 75.0% of

respondents was the lack of sufficient capital. Many students highlighted that, even with access to incubation programs, the inability to secure enough funding limited their capacity to scale operations, purchase materials, or invest in marketing. One respondent stated,

"We had a good product, but without enough money, we couldn't expand or reach more customers."

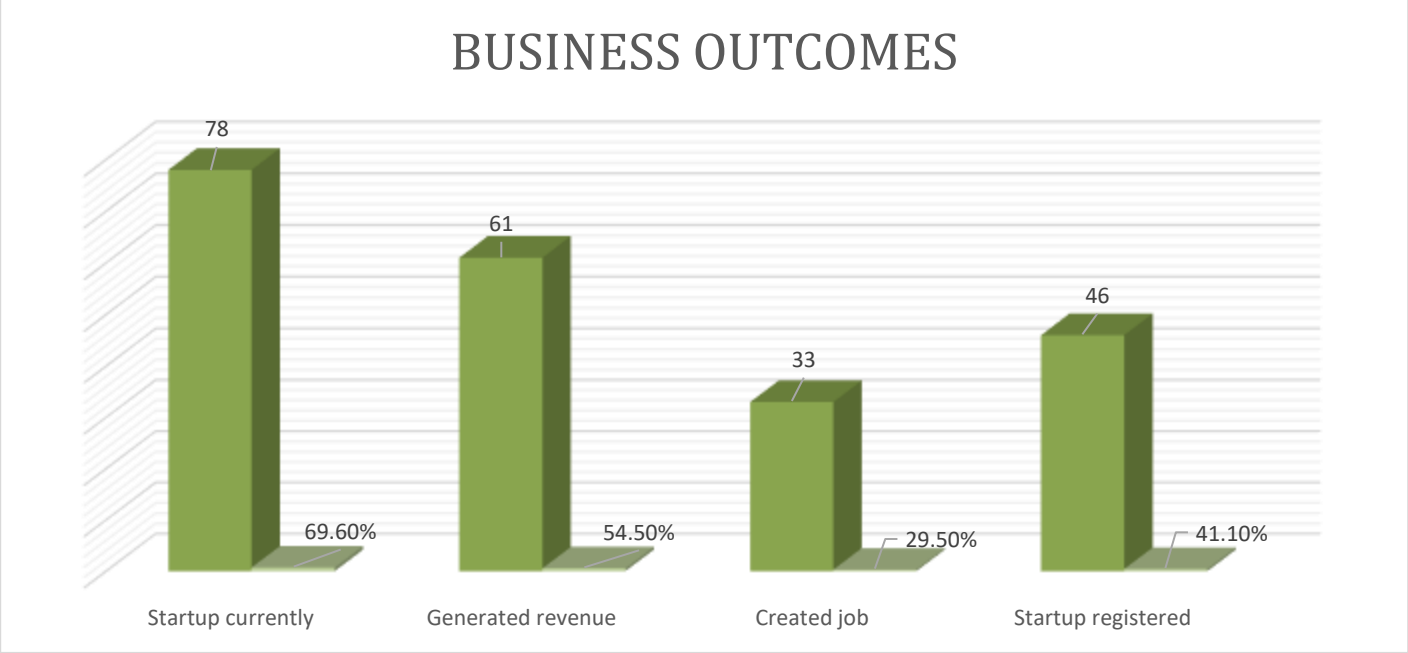

Figure 3: *Business outcomes.*

In addition to financial constraints, limited market access affected 55.4% of the participants, restricting their ability to sell products beyond local or campus settings. Several students expressed frustration over the difficulty in breaking into larger or more competitive markets, with one noting,

"Finding reliable customers outside the university was tough, and this slowed down our growth."

Inadequate mentorship was another challenge reported by 42.9% of respondents. While mentorship programs existed, some students felt the guidance was too general or insufficiently tailored to their specific business needs. A participant remarked,

"Sometimes the advice felt generic and didn't address the real problems my startup was facing."

Bureaucratic sprints related to registration and legal processes also posed barriers for 44.6% of the entrepreneurs. Many found the formalities involved in registering their businesses with government authorities to be complicated, time-consuming, and costly. As one respondent explained,

"The registration process was confusing and delayed our ability to operate officially, which affected customer trust."

These combined challenges created a difficult environment for student ventures to thrive fully, emphasizing the need for more comprehensive support systems that address financial, market, mentorship, and regulatory barriers within the incubation framework.

4. CONCLUSION AND RECOMMENDATION

This study explored the impact of university startup incubators on student ventures in Iringa Municipal, focusing on key areas such as access to resources, mentorship support, networking opportunities, business outcomes, and challenges faced by student entrepreneurs. The findings revealed that incubators played a positive role in providing essential resources like office space, internet access, and business training, which helped many students develop and sustain their ventures. However, access to seed funding, personalized mentorship, investor exposure, and formal market linkages remained limited. Despite these constraints, a majority of student ventures remained operational, with many generating revenues and a few creating employment opportunities. The study also exposed significant challenges including lack of capital, limited market access, inadequate mentorship, and

bureaucratic hurdles in business registration. These findings show the need for stronger institutional and policy support to enhance the effectiveness of university incubators, particularly in semi urban settings like Iringa.

The study recommends the following:

- Universities should establish dedicated seed funding schemes or collaborate with financial institutions and development partners to provide grants or low-interest loans to student entrepreneurs. This will help students move from ideation to commercialization more effectively.
- Incubators should recruit a broader network of experienced entrepreneurs and industry professionals to offer targeted and personalized mentorship based on the specific needs and sectors of student ventures.
- Institutions should organize regular expos, pitch events, and business fairs that connect student startups with investors, customers, and industry partners to improve visibility and market reach.
- Universities, in collaboration with government agencies like BRELA and TRA, should offer legal support services or host mobile registration clinics to assist students in crossing the formal business registration process efficiently.
- Continuous monitoring and feedback mechanisms should be integrated into incubator programs to assess their effectiveness, address gaps, and adapt services to the evolving needs of student entrepreneurs.

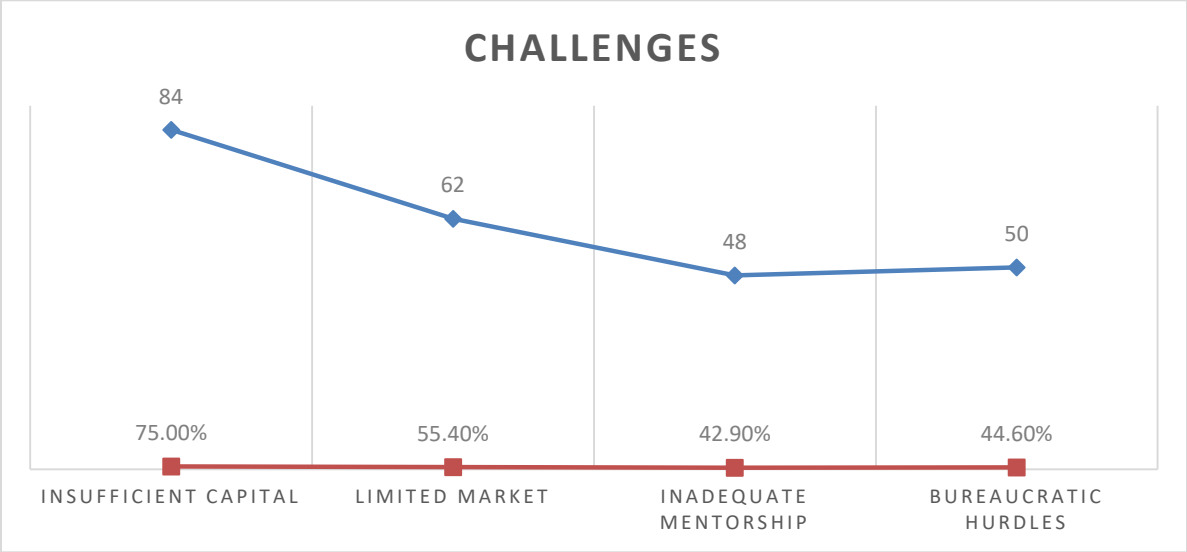

Figure 4: *Challenges faced.*

Based on the findings of this study in the future research can be done on:

- Examine the long-term success and growth of student ventures after graduating from incubator programs, assessing sustainability, profitability, and job creation over time.
- A comparative study between incubators in urban areas and those in semi-urban settings could reveal contextual differences in effectiveness, resource availability, and student outcomes.
- Explore how gender influences access to incubation resources, mentorship, funding opportunities, and overall entrepreneurial performance among university students.
- Investigate how virtual incubators or online mentorship programs compare with traditional, physical incubators in supporting student entrepreneurs.
- Assess the role of national and institutional policies in shaping the effectiveness of university startup incubators, including funding structures, legal support, and academic integration.

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